

# Emanuele Rossi

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## Summary

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I'm an ML researcher specializing in generative models for structural biology. Before jumping into MLxBio, my background combined **fundamental research** experience with real-world **product impact**. I'm the first author of [Scalable Inception Graph Network](#) [🔗](#), now **used in production by AirBnB** [🔗](#), and [Temporal Graph Network](#) [🔗](#), which has received over **750 Github stars** [🔗](#). While at Twitter, I successfully developed multiple ML models for the "**who-to-follow**" recommendation feature, resulting in an increase of over **1.2M follow actions daily**.

## Education

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### Imperial College London

Oct 2020 – Feb 2024

*Ph.D. in Computer Science*

- My [research](#) [🔗](#) focused on solving the challenges preventing the success of **Graph Neural Networks** on real-world applications
- My work has been published at top conferences including ICML, ICLR, AAAI and RecSys
- Supervised by Prof. Michael Bronstein

### University of Cambridge

Oct 2018 – Jun 2019

*Master in Advanced Computer Science*

- Graduated with **Distinction (4.0 GPA)**
- Thesis: "**Graph Deep Learning for ncRNA data**" ([published](#) [🔗](#) at KDD 2019 GDL workshop)
- Supervised by Prof. Pietro Liò

### Imperial College London

Oct 2015 – Jun 2018

*Bachelor in Computer Science*

- Graduated with **First Class Honors (4.0 GPA)**

## Experience

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### Machine Learning Researcher

NYC

*VantAI*

Jan 2024 – Present

- **Leading the development of an all-atom foundation model for structural biology**, leveraging **Latent Diffusion** to perform multiple tasks simultaneously, including **cofolding, design, inverse folding, and docking**
- **Data processing**: Curated and structured biomolecular datasets for efficient and de-leaked model training (see [Plinder](#) [🔗](#) and [Pinder](#) [🔗](#))
- **Model formulation & exploration**: Designed and refined diffusion-based formulations and model architectures
- **Inference & benchmarking**: Built a robust inference pipeline and developed comprehensive evaluation metrics

### Machine Learning Researcher

London

*Twitter*

Jun 2019 – Feb 2023

- Worked on **applied and fundamental research** around **graph neural networks**
- **Scaled** these technologies to graphs with **tens of billions of edges**
- Developed an embedding-based model to recommend users "who to follow", leading to an **increase of 1.1M follow actions** per day on the platform

### Machine Learning Engineer

London

*Fabula AI*

Mar 2019 – Jun 2019

- Researched and developed **novel graph deep learning models** for **fake news classification**

- Fabula AI was acquired by Twitter in June 2019

## Software Engineering Intern

Google

California

Jul 2017 – Oct 2017

- Worked in the **Google Play Store** infrastructure team

## Selected Publications

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- *E. Rossi et al.* Temporal Graph Networks for Deep Learning on Dynamic Graphs. *ICML 2020 GRL Workshop*. [arXiv:2006.10637](#) [🔗](#), [blog](#) [🔗](#). A new model for deep learning on dynamic graphs (¿300 citations, ¿700 Github stars). Adopted by [memgraph](#) [🔗](#) (graph analytics company) and used by GraphCore to [benchmark their hardware](#) [🔗](#).
- *E. Rossi\**, *F. Frasca\** et al. SIGN: Scalable Inception Graph Neural Networks. *ICML 2020 GRL Workshop*. [arXiv:2004.11198](#) [🔗](#), [blog](#) [🔗](#). First graph deep learning model to scale to graphs with billions of edges (¿200 citations). Used in [production by Airbnb](#) [🔗](#).
- *B. Chamberlain, S. Shirobokov, E. Rossi et al.* Graph Neural Networks for Link Prediction with Subgraph Sketching. *ICLR 2022, Oral (top 5%)*. [arXiv:2209.15486](#) [🔗](#). First GNN model to scale link prediction to graphs with millions of nodes thanks to sketching, a hashing technique which enables efficient computation of subgraph statistics.
- *E. Rossi et al.* On the Unreasonable Effectiveness of Feature propagation in Learning on Graphs with Missing Node Features. *Learning on Graphs Conference 2022*. [arXiv:2111.12128](#) [🔗](#), [blog](#) [🔗](#). First model to enable scalable graph learning with partially missing node features.

## Projects and Awards

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### LeadTheFuture

Jun 2018 – Mar 2023

Co-Founder

- [LeadTheFuture](#) [🔗](#) is a **non-profit mentoring organization** and the **largest merit-based STEM community in Italy**, with more than **200 mentors** (engineers, researchers, and entrepreneurs) and **500 selected mentees**
- Our work has been featured in [Forbes](#) [🔗](#)

### Talks and Blog Posts

- I have written a series of blog posts on my research ([full list](#) [🔗](#)) and have been invited to give over 10 talks ([full list](#) [🔗](#))